

MANITOBA
OIL AND GAS
CORPORATION

ANNUAL
REPORT

Corporate Profile

Manitoba Oil and Gas is a newly formed Manitoba crown corporation involved in the exploration and development of petroleum resources within the Province. 1984 represents the initial year of operations for the Corporation.

Table of Contents

Letter of Transmittal.....	1
Minister's Message.....	2
Chairperson's Message.....	3
President's Message.....	4
Assessment of the Environment and Opportunities.....	5
Operations	8
Industry Information.....	10
Financial Review	12
Financial Statements.....	13
Glossary of Terms.....	18

METRIC CONVERSION TABLE

1 cubic metre (oil)	= 6.293 barrels
1 cubic metre (natural gas)	= 35.49 cubic feet
1 tonne	= 1.102 short tons
1 hectare (10,000 square metres)	= 2.471 acres
1 kilometer	= 0.625 miles



The Honourable Pearl McGonigal
Lieutenant Governor of the Province of Manitoba

May it please your Honour.

I have the honour of presenting to you the Annual Report of The Manitoba Oil and Gas Corporation for the year ended December 31, 1984.

This report records the activities of the Corporation and provides a background to the petroleum resources industry.

Wilson Parasiuk,
Minister.

Minister's Message

Petroleum is an important form of energy and, in recent times, the potential disruptions of supply accompanied by escalating prices have affected all industrialized societies. While Manitoba is not a large oil producing province, we nevertheless provide about one percent of Canadian oil production which accounts for \$175 million in revenues annually and approximately 30 percent of the province's oil consumption. All of the natural gas consumed in the province originates in Alberta.

Most of the provinces, as well as the Federal government, have established crown corporations in the petroleum industry for their own particular reasons. Manitoba, which is one of the last provinces to do so, created its own petroleum resource company in order to promote economic development with local decision-making, local job creation and reinvestment of profits in the province.

Virtually all of the oil and gas companies now active in the province have their head offices located elsewhere. This represents an opportunity loss of highly-skilled, well-paying jobs to Manitobans. While we are pleased with the industry's current investment level in Manitoba, the industry is fickle and will, from time to time, invest its cash elsewhere. The current competitive fiscal regime (i.e. royalties, taxes, etc., similar to other provinces) does not by itself guarantee a stable level of activity.

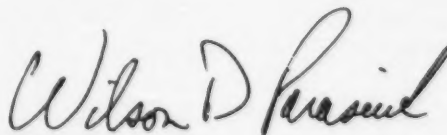
Therefore, we believe that to manage the provincial resources in the most effective manner and obtain optimal returns for the citizens of Manitoba, we need an active crown company to supplement the regulatory role that governments traditionally play.

The Manitoba Oil and Gas Corporation commenced operations in 1984 and is managed on behalf of the people of the Province by a Board of Directors appointed by the Lieutenant Governor in Council. As Minister responsible for the Corporation and on behalf of our Government, I have conveyed to the Board the following "expectations" that we have for this new company:

1. To act as a catalyst in the development of Manitoba's petroleum resources.
2. To achieve profitability and financial self-sufficiency within a reasonable length of time.
3. To provide a vehicle for stabilizing oil and gas exploration and development activities in the province during downturns in the industry.
4. To increase the participation rate of Manitoba oil and gas companies, contractors and suppliers through joint ventures and other activities.
5. To operate without any special privileges.

A \$20 million line of equity funding has been established for the Corporation. These funds will be advanced, in exchange for shares issued to the Minister of Finance, as required and in accordance with a Cabinet approved corporate plan.

We encourage the Corporation to participate with other industry partners through joint venture agreements and look forward to results in the future which meet the expectations outlined above.



Wilson Parasiuk
Minister

Chairperson's Message

On behalf of the Board of Directors, I am pleased to present the first Annual Report of The Manitoba Oil and Gas Corporation.

The first year's activity for any new company is an exciting and busy time — establishing an appropriate organization, selecting management and staff and setting the initial direction of the Corporation. I am happy to be able to report that these activities are now substantially complete and that the Corporation is in business and actively participating in Manitoba's petroleum scene.

As stated in its mandate, The Manitoba Oil and Gas Corporation "will promote exploration and development of oil and gas in the province as a direct participant in the industry". Initial operations reflect a small, specialized organization, with future expansion to be determined by success rates, revenues, profitable investment opportunities, and the economic environment in the energy industry in general.

The Manitoba Oil and Gas Corporation is well positioned to fulfill its economic development objective of influencing the rate of development and contributing to the stability of the petroleum industry in Manitoba. As importantly, the Corporation will be pursuing its commercial objective of achieving financial returns that are comparable to industry norms. That the Corporation will strive to demonstrate exemplary corporate behaviour, now and in the future, with its various publics and employees is a stated objective that the Corporation deems to be part of its corporate self-definition and responsibility.

The future of Manitoba's petroleum sector promises to be both exciting and challenging. The Manitoba Oil and Gas Corporation looks forward to the satisfaction of participating in the industry and meeting the challenges. We trust that other firms, individuals and landowners presently located in Manitoba, and those who would like to become active in the province, will find The Manitoba Oil and Gas Corporation a good business partner.



Robert M. Silver
Chairperson

President's Message

The purpose of an annual report is to provide the shareholders with relevant information for the year under review including the financial results of operations, operating highlights and management's assessment of past events and future opportunities.

The start-up year for any company, while challenging, exciting and full of promise, does not provide much in the way of tangible results upon which to judge its performance. Due to the nature of the business, this will start to become evident next year and certainly more so within the next two or three years.

The important activities undertaken this year are those of getting a small oil and gas exploration and development company up and running. The fact that it is a crown corporation owned by the people of Manitoba adds an additional dimension which will see us concentrating our efforts on developing Manitoba's resource base and meeting the expectations and goals referred to in the Minister's and Chairperson's messages.

We have been able to attract well qualified people to staff the positions in our organization and have set challenging goals and corporate development plans that we expect will provide returns commensurate with the risks taken. Our primary goal is to find one to two million barrels of reserves at a cost of less than \$8.00 per barrel within the next four years.

In the latter part of the year we participated in the provincial Crown land sale. We were successful in acquiring three parcels of land which enabled us to enter into an agreement for additional lands through a reciprocal arrangement. The Corporation also acquired a ten percent interest in a pipeline being constructed to transport crude oil from the Waskada field to the Interprovincial Pipeline at Cromer, Manitoba. The pipeline was substantially complete by year end and is expected to begin operating in January, 1985.

We look forward with a good deal of optimism to the future development of Manitoba's petroleum resource potential and the part that the Corporation will play in helping it along.



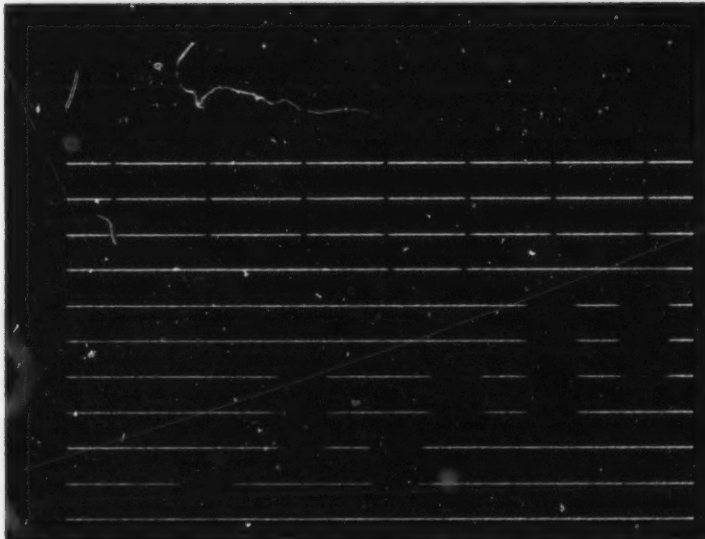
John R. Sadler
President

Assessment of the Environment and Opportunities

The future success of this Company, like any organization, depends on our ability to interpret and understand the influences which shape the environment in which we operate and then make sound business decisions consistent with our mandate and goals. The petroleum industry is closely regulated at the provincial and national levels, yet at the same time is sensitive to international events. It is within this environment, and the mandate provided by the provincial government, that we have determined our course of direction.

Oil is an internationally traded commodity, and world oil prices are greatly influenced by decisions of the Organization of Petroleum Exporting Countries (OPEC) cartel. OPEC's decisions, in turn, are influenced by the world supply/demand balance, their desire to maximize revenues over time and pay for the modernization of their countries. The Western world's available supply of 58 million barrels per day exceeds current demand by 25 percent. Virtually all of this spread has been absorbed by the OPEC nations, who are capable of producing 30 million barrels per day but have collectively cut back to approximately 18 million barrels per day. This reduction in demand is due to conservation and oil substitution measures taken by importing nations after the 1974 "oil shock" and the general recession and economic slowdown of the past few years. As industrialized countries work their way back to more normal economic growth rates over the next years, some growth in oil demand will also become evident, which will see a resurgence in the OPEC share of the market.

Cost of Crude Oil*



* Cost of finding, producing and transporting to market. Does not include royalties and taxes.

Oil found in Canada after 1974 receives world oil prices and, while it is expected that all oil will move to world price before long, it is "new" oil prices that govern our investment decisions.

Manitoba's oil is good quality and close to eastern markets. Due to a decline of the Canadian dollar relative to the U.S. dollar over the past year, returns to Canadian producers have actually increased in spite of recent declines in the official world oil price.

Opportunities

Our efforts will focus on opportunities within the province and the frontier area contiguous to it — namely Hudson Bay. Although Manitoba currently accounts for only about one percent of Canadian production, this amount represents about \$175 million in revenues annually. Since 1950, approximately 150 million barrels of crude oil have been produced in Manitoba. There are about 50 million barrels of known reserves remaining in currently producing fields in the province, and Enhanced Oil Recovery (EOR) techniques could sweep out an additional 40 million barrels from these reservoirs.

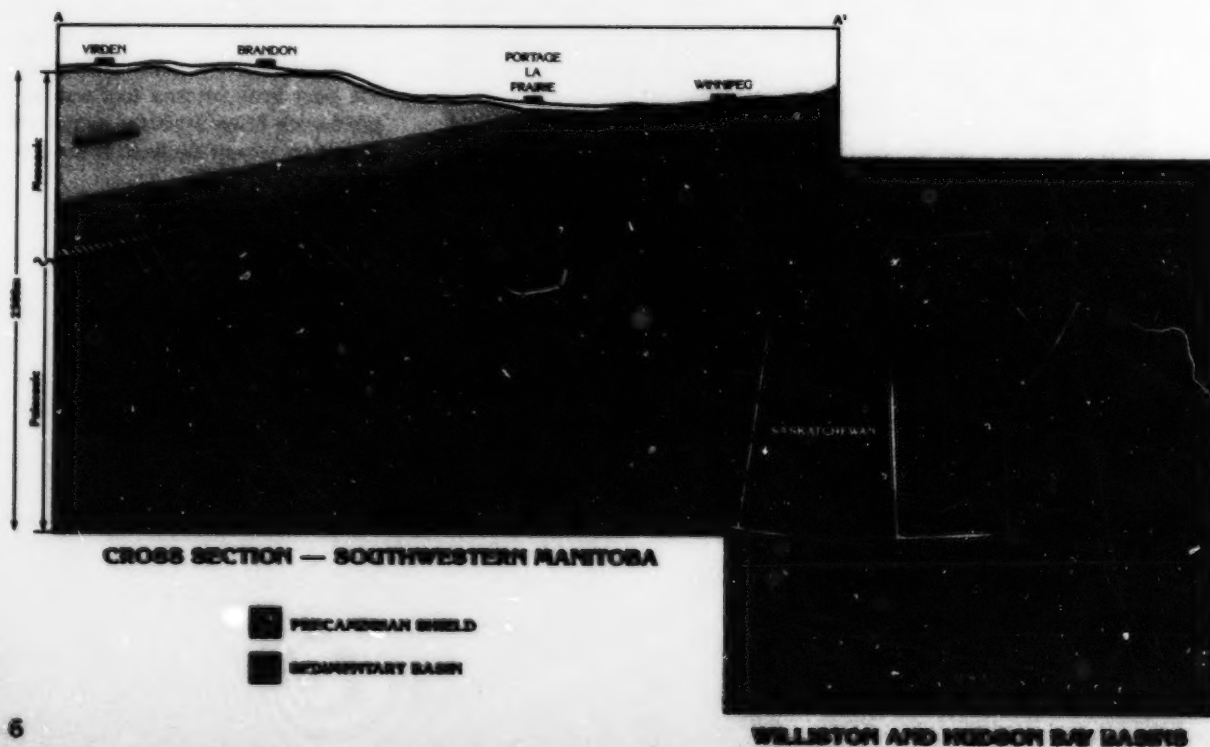
New oil exploration potential in the "Mississippian and above" formations is in the vicinity of 40 million barrels, with upward of 60 million barrels potential in the deeper sediments of the Williston basin. The Hudson Bay basin, while rated less attractive than other areas such as the Beaufort Sea and East coast, could ultimately yield as much as 700 million barrels. This arena and the deep Williston are high risk, high cost exploratory areas.

We believe it is possible for the Corporation to gain a significant presence in the industry in Manitoba over the next five years and, at the same time, provide financial returns to the province commensurate with risks taken and investments made.

Supply and Demand Balance for Domestic Light Crude Oil Canada



SOURCE: NEB Report, September, 1984, "Canadian Energy Supply and Demand 1983 — 2005".



Provincial Economics

While size of reservoirs and production rates are relatively low in Manitoba, the province still offers some of the most attractive economics in western Canada. The returns illustrated must, of course, be discounted to take into account geologic and operating risks. Industry success rates have been running at 1:4 on exploratory drilling and 3:4 on development drilling.

Cumulative Cashflow Before Tax

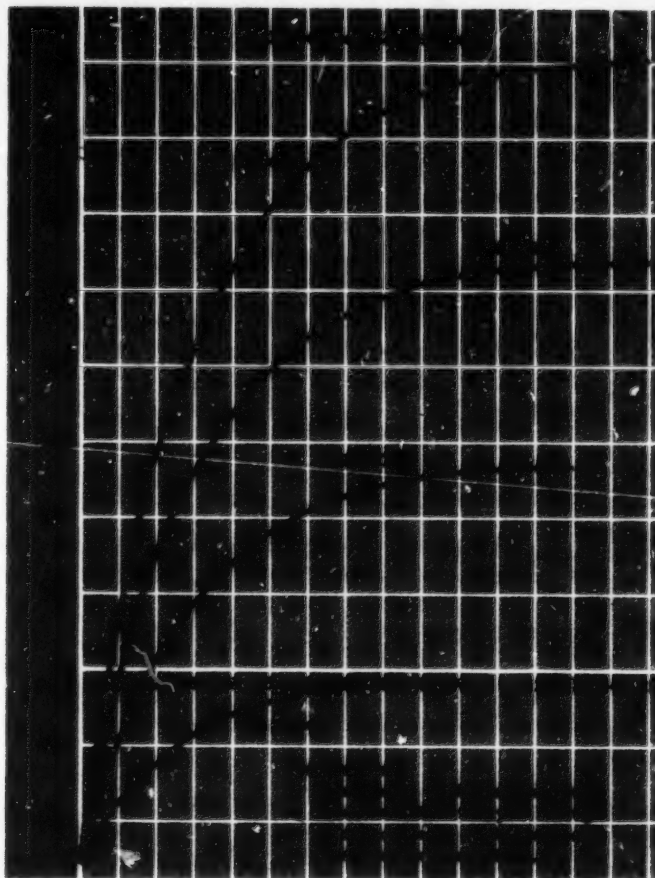


Illustration of cash returns in Manitoba (per barrel):

"New" oil price		\$41.00
Less: Royalties*	\$8.60 (\$11.60 after 2 yrs)	
PGRT**	4.40	
Operating Costs	<u>4.85</u>	<u>17.85</u>
Gross Cash Inflow per Barrel		<u>\$23.15</u>

* Manitoba Provincial Royalties provide for reduced royalties during payout period (approximately two years).

** Federal Petroleum and Gas Revenue Tax — a \$500,000 per year PGRT exemption is provided to all exploration/production companies.

Operations

Exploration Activity

The year under review represents the first year of operations for the Company. Consequently, substantial efforts were devoted towards acquiring technical knowledge of Manitoba's geology and developing a corporate direction which reflects the resource base and opportunities available within the province.

It was not until the latter part of the year that the Corporation participated, on a farm-in basis, in three test wells (0.65 net wells). Although all three wells were abandoned as non-commercial tests, this involvement provided management with experience in Manitoba's petroleum industry as well as exposure to operators, drilling contractors and related service industries as a direct participant.

At the same time, technical studies undertaken in-house have generated several drilling prospects for 1985, the majority of which will be in low-risk, development locations, usually offsetting existing production. Exploration drilling activity will concentrate predominantly on an evaluation of a joint venture seismic program in the southwest corner of the province, which will be completed in the early part of 1985.

As a result of exploration and development activities planned for the coming year, production from Company-operated as well as non-operated wells will undoubtedly become a reality in 1985.

Pipeline

The Corporation holds a ten percent interest in the ICG Manitoba Pipeline joint venture. This 58 mile (93 kilometre) pipeline transports crude oil from the Waskada field in southwestern Manitoba and connects with the Interprovincial Pipeline near Cromer, Manitoba.

This line will provide oil operators in the area with a reliable means of transporting oil on a year round basis as opposed to trucking, which is subject to disruptions caused by spring breakup and inclement weather. It will also eliminate a substantial amount of heavy traffic which has had a detrimental affect on the roads in this area of the province.

The Corporation's ten percent ownership represents an investment of approximately \$500,000. The Company is pleased to report that construction has proceeded on schedule and that the line was substantially complete at year end. Shipments through the pipeline are anticipated to commence in January, 1985.



Land Holdings

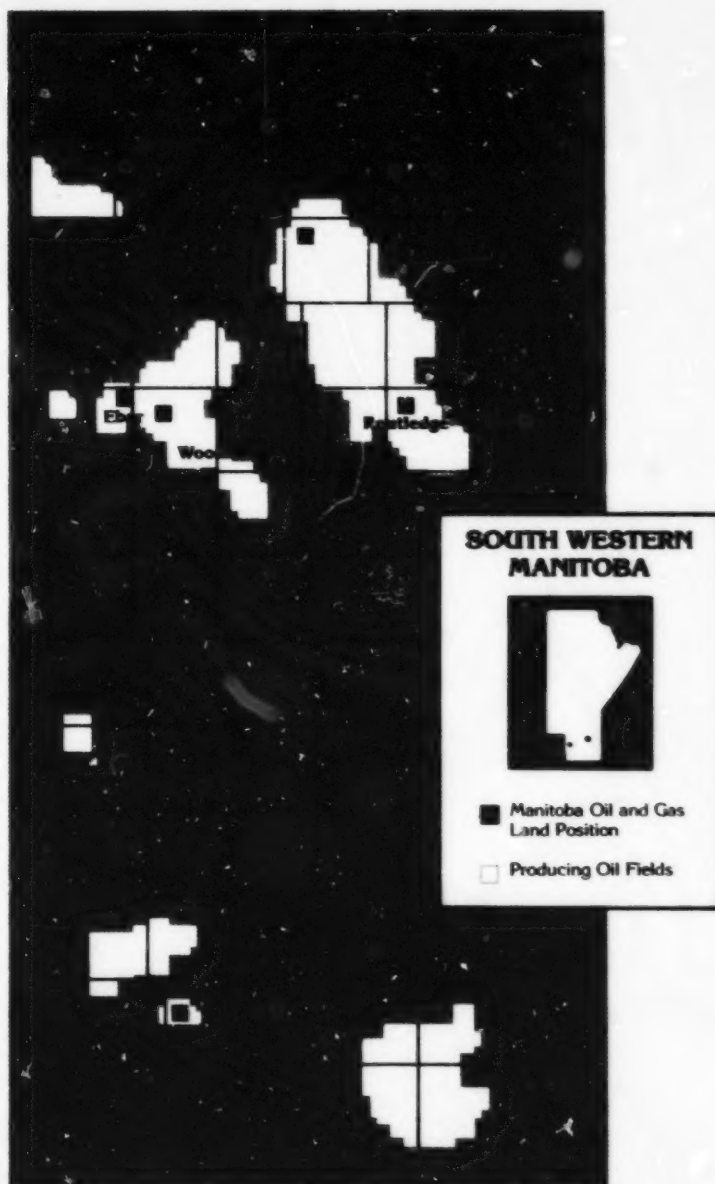
Initial activities during 1984 centered on a review and evaluation of opportunities currently available to the Company in an effort to secure a promising land base for future development. In the latter part of the year, the Corporation was successful in acquiring interests in several properties which are located in areas offsetting existing production and in areas which the Company intends to drill within the immediate future.

Approximately \$100,000 was spent on Freehold and Crown mineral rights in 1984; the majority of which was expended at the October, 1984 Crown land sale. The Company acquired drilling rights in 560 gross (400 net) acres during this sale. Additional acreage amounting to 720 gross (132 net) acres was earned through farm-in agreements by participating in wells on land held by others.

LAND HOLDINGS

as at December 31, 1984

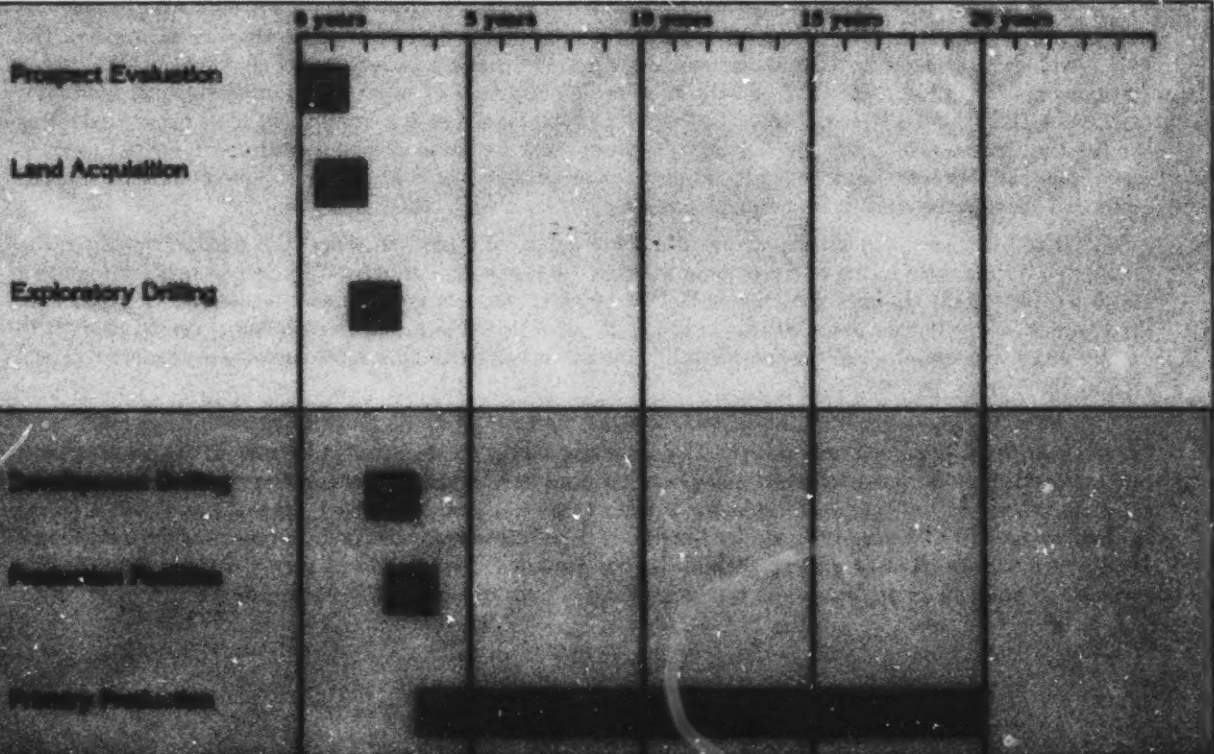
	Gross (acres)	Net
Daly	160	80
Ebor	160	80
Routledge	200	50
South Pierson	40	10
Virden	80	80
Woodnorth	160	160
Others	<u>480</u>	<u>72</u>
TOTAL	<u>1280</u>	<u>532</u>
	518(ha)	215(ha)



Typical Timing and Sequence of Oil Development

Stage	Activities	Purpose
Exploration		
1. Prospect Evaluation	Geological and geophysical studies, seismic analysis, area mapping	To define and locate potential hydrocarbon bearing sedimentary formations and geologic traps within them
2. Land Acquisition	Acquire or lease mineral rights, negotiate surface rights, undertake property registrations and title searches	To establish the most economically desirable land position at an acceptable price as relates to bonus payments, lease rentals and royalties
3. Exploratory Drilling	Drilling of initial well, drill stem testing, well logging and core sample analysis	To determine the existence, permeability and porosity of potential oil-bearing formations and to justify the costs of completing and equipping
Primary Development		
4. Development Drilling	Drilling of lower risk offset wells, continued gathering of geological/geophysical information	To develop reserves and uncertainties more into the larger base
5. Production	Equip wells for production, arrange for transportation and possible construction of treating facility (battery) and flow line	To prepare the wells for production
6. Primary Production	Operating and maintaining production equipment and shipping production	Transition reserves into reserves and deliver revenues streams

Time



Management's Financial Review and Analysis of Operations _____

The period under review represents the first year of operations for the Company. As such, the financial statements reflect some of the unique effects that can arise during the initial growth stage of a company. The most notable examples reflected in the accompanying statements are the write-off of all drilling costs incurred to December 31, 1984 (\$158,000) as well as a one-time charge of organization costs against operations (\$105,000). Drilling costs were expensed as a result of applying the ceiling test against costs capitalized under the full cost method. Although the Company's direct participation in drilling ventures was limited to three wells (0.65 net), none of these wells proved to be commercially viable which necessitated the write-down of all related costs in the absence of producible reserves.

The Company also participated in the construction of a pipeline which will transport oil from the southern Waskada field to the Interprovincial Pipeline near Cromer, Manitoba. The Corporation's ten percent share is expected to cost approximately \$500,000, of which about \$389,000 has been expended at year end. Other areas of significant capital investment include undeveloped land (\$80,380), seismic studies (\$110,000) and furniture and operating equipment (\$55,100). The balance of expenditures were related primarily to general and administrative operating costs.

Although operations officially commenced in January, 1984, the majority of the management team did not join the Company until mid-year. Consequently, direct involvement in oil and gas exploration was minimal as initial efforts were aimed at developing a comprehensive understanding of the geology of the province related to the petroleum industry, and to acquire a land base from which to establish a sound exploration and development program for the future. The Corporation has been successful in the initial stage of both of these objectives. Manitoba Oil and Gas has attracted strong technical people and has the financing available to build on its programs and take advantage of opportunities available in 1985.

THE MANITOBA OIL AND GAS CORPORATION

Balance Sheet December 31, 1984

Assets

Current Assets

Cash	\$ 35,937
Funds held in trust (note 5).....	3,950,000
Accounts receivable (note 6).....	30,566
Deposits and prepaid expenses	<u>7,526</u>
	\$ 4,024,029

Property and equipment less accumulated depletion, depreciation and amortization (note 4).....	<u>622,090</u>
	\$ 4,646,119

Liabilities

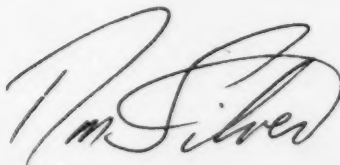
Accounts payable.....	\$ <u>141,503</u>
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Equity, Province of Manitoba

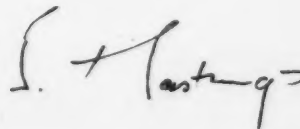
Share capital (note 5).....	5,000,000
Deficit.....	<u>495,384</u>
	\$ 4,504,616
	\$ 4,646,119

Approved on Behalf of the Board

Director



Director



The accompanying notes are an integral part of this Balance Sheet.

THE MANITOBA OIL AND GAS CORPORATION

Statement of Operations

For the Year Ended December 31, 1984

Revenue	
Miscellaneous income	\$ 5,800
Expenses	
General and administrative	226,538
Depletion, depreciation and amortization	11,984
Total expenses	\$ 238,522
Loss from operations before unusual items	\$ 232,722
Write-down of oil and gas properties (note 3)	158,076
Organization costs	104,586
Net loss and deficit for the year	\$ 495,384

The accompanying notes are an integral part of this Statement.

Auditor's Report

To the Shareholders of The Manitoba Oil and Gas Corporation:

We have examined the balance sheet of The Manitoba Oil and Gas Corporation as at December 31, 1984 and the statement of operations and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the company as at December 31, 1984 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles consistently applied.

Deloitte Haskin & Sells

February 8, 1985

THE MANITOBA OIL AND GAS CORPORATION

Statement of Changes in Financial Position For the Year Ended December 31, 1984

Funds Were Provided From:

Issue of share capital	\$ 5,000,000
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Funds Were Used For:

Operations

Loss from operations	495,384
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Less: Depletion, depreciation and amortization	11,984
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Write-down of oil and gas properties.....	158,076
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	\$ 325,324
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Acquisition of property and equipment.....	792,150
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	\$ 1,117,474
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Increase in Working Capital.....	\$ 3,882,526
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THE MANITOBA OIL AND GAS CORPORATION

Notes to Financial Statements

December 31, 1984

1. Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles. The Corporation's significant accounting policies are summarized below.

Joint Ventures

Substantially all of the Corporation's exploration activities are conducted jointly with others. These financial statements reflect only the Corporation's proportionate interest in such activities.

Full Cost Method of Accounting

The Corporation follows the full cost method of accounting for oil and gas operations wherein all costs related to the exploration for and development of oil and gas reserves are capitalized. Such costs include lease acquisition costs, geological and geophysical expenditures, lease rentals on undeveloped properties, costs of drilling both productive and non-productive wells and all technical and administrative overhead directly associated with exploration and development activities.

Proceeds from property and equipment sales are credited against accumulated costs except when the sale represents a significant disposal of property and equipment in which case a gain or loss is recorded on disposition.

Depletion, Depreciation and Amortization

Depletion of oil and gas properties and depreciation of production equipment and facilities, including investment in the pipeline, are calculated using the unit-of-production method based on estimated proven reserves of oil and gas.

Depreciation on other equipment is calculated on the declining balance basis at rates ranging from twenty to twenty-five percent. Leasehold improvements are amortized over the remaining term of the lease.

2. Status of the Corporation

The Manitoba Oil and Gas Corporation was established as a Crown Corporation under The Manitoba Oil and Gas Corporation Act, Bill 4, in 1983. Under the provisions of its Act, the Corporation conducts activities to promote exploration and development of oil and gas as a direct participant in the industry.

3. Write-down of Oil and Gas Properties

Under generally accepted accounting principles, the capitalized cost of oil and gas properties is limited to the present value of future net revenues from estimated production of reserves. During 1984, the first year of operations, the Company participated in a total of three drilling ventures which proved to be unsuccessful. As a result of the failure to find commercial reserves prior to year end, all related costs have been written off. Undeveloped properties are carried at the lower of cost and fair market value.

4. Property and Equipment

Petroleum and natural gas properties.....	\$	348,456
Pipeline.....		388,584
Office equipment and leasehold improvements.....		<u>55,110</u>
	\$	792,150
Less: Write-down of exploration costs (note 3).....		158,076
Depreciation and amortization		<u>11,984</u>
	\$	<u>622,090</u>

5. Share Capital

Under The Manitoba Oil and Gas Corporation Act, the Corporation is authorized to issued 200,000 shares for a maximum consideration of \$20,000,000. During the year, the Corporation issued a share certificate to the Minister of Finance for 50,000 shares (\$5,000,000). As at December 31, 1984, the Corporation has received \$1,050,000 of equity financing in respect of these shares. The balance of \$3,950,000 is held in trust by the Minister to be advanced as funds are required to finance operations. Undisbursed funds held in trust are non interest-bearing to the Corporation.

Authorized

200,000 shares; maximum consideration.....	\$	<u>20,000,000</u>
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Issued

50,000 shares.....	\$	<u>5,000,000</u>
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6. Related Party Transaction

At December 31, 1984, the Company has an amount receivable of \$16,000 in respect of an interest-bearing relocation loan provided to an employee of the Company.

GLOSSARY OF TERMS

- Acidizing** — Treatment of oil-bearing sandstone or limestone formations with a solution of hydrochloric acid and other chemicals to increase production. The acid is forced under pressure into the formation where it enlarges the flow channels by dissolving the calcareous component of the rock.
- Barrel** — Standard unit of measurement in the petroleum industry. The metric measure is a cubic metre, which is 6.293 times the size of a barrel.
- Battery** — Tanks, separators and other production equipment serving a number of wells used to bring oil to a marketable condition.
- Bit or Drill Bit** — An attachment to the end of the drill string, consisting of three conical heads. Rotation of the string during drilling rotates the toothed heads as well, and cuts the rock.
- Casing** — Pipe which is run into a successful well after drilling and cemented in place between the outside of the pipe and the rough hole. It also effectively isolates the zones in the well from each other.
- Complete/Completion** — After a well is cased, the process of bringing a well on production, including perforating, acidizing and fracturing, if necessary.
- Core** — Instead of drilling, in order to get a sample of the vertical section, a cylindrical sample is cut with a hollow pipe called a core barrel.
- Crown** — The Government in the Right of Canada or of a province.
- Crown Lease** — The Agreement held with the Department of Energy and Mines which provides for the exploration and development of the petroleum and natural gas rights.
- Decline Rate** — The rate at which a well's production declines due to natural and sometimes man-introduced forces. Expressed in percent per year.
- Development Well** — Well drilled for oil and gas within a proven field or area for the purpose of completing the desired pattern of production.
- Drill Stem Test** — A type of production test during drilling where a zone is isolated and allowed to flow into the drill string. The reservoir fluid is sometimes recovered, and the pressure response of the formation is recorded and analyzed. The results of this test help to determine the potential productivity of the well.
- Drill String** — String of individual joints of pipe that extends from the bit to the floor of the rig and carries the mud down to, and rotates, the bit.
- Dry Hole** — Generally refers to any well that does not produce oil or gas in commercial quantities, and is therefore not completed.
- E.O.R. (Enhanced Oil Recovery)** — The process of stimulating the flow of oil to the wellbore through various methods such as water flood, heat or steam injection, etc. as a means to increase the recoverable reserves of a producing oil pool.
- Equipping** — Preparation of a well for production. Equipment typically includes such items as a pump jack, bottomhole pump, motor, rods, storage tanks and valves and fittings.
- Exploratory Well** — Well drilled in unproven territory in search of a new oil or gas field. Also known as a "wildcat well".
- Farm-Out** — An arrangement under which a portion of an interest in petroleum and natural gas rights is assigned in consideration for the assignee agreeing to explore or drill (and perhaps equip) one well or several wells at his sole expense; subsequent development and equipment costs, if any, and income and operating expenses, are shared by the participants on an agreed basis. In its broadest sense, the term includes any arrangement wherein an owner agrees to dilute his interest in a property.
- Field** — A defined oil or gas producing area containing one or more oil or gas pools.
- Formation** — Sedimentary bed or deposit composed substantially of the same minerals throughout and distinctive enough to be a unit.
- Fracture** — A treatment whereby the rock opposite a perforated interval is cracked open by a high pressure injection of fluid and remains propped open by pumping in sand. Designed to increase well productivity.
- Freehold** — Property other than property in the right of the Crown.
- Freehold Lease** — An Agreement held with an individual which provides for the exploration and development of the petroleum and natural gas rights underlying a given area.
- Hydrocarbon** — Organic chemical compound of hydrogen and carbon. The molecular structure of the most common petroleum hydrocarbon compounds varies from the simplest — methane, a constituent of natural gas — to the very heavy and complex asphalt group.
- Injection Well** — A well used to inject any fluid or gas for pressure maintenance, storage, disposal or secondary recovery.
- Joint Venture** — A joint venture is a partnership for a common purpose. Two or more companies combine part of their property, money, effort, skill and knowledge in a single enterprise, usually as a means of spreading the risk or to avoid duplication of costs.
- Lease** — Rights held by agreement to explore for, develop and take petroleum and/or natural gas, or in another sense, agreement for a fixed term, and so long thereafter as production shall continue, permitting the holder to explore for, develop and take petroleum and/or natural gas from a property subject to payment or reservation of a royalty and to other consideration.
- Lessee** — The individual or company who negotiates a petroleum and natural gas lease with the beneficial owner of the rights.
- Lessor** — The beneficial owner of petroleum and natural gas rights underlying a given area.
- Log** — A continuous vertical recording of natural or induced electrical, radioactive or sonic impulses of the formations which can be interpreted to ascertain rock type, porosity, permeability and fluid content in varying degrees of accuracy.
- m³** — A cubic metre — a metric measurement for volumes of crude oil or natural gas.
- M.C.F.** — A unit of measurement (a thousand cubic feet) applied to gas.
- Mud** — A fluid used in drilling to remove cuttings from the hole; it also cools and lubricates the drilling bit and controls underground formation pressures while drilling.

Offset Well — A well drilled adjacent to another well in the same pool.

O.P.E.C. — Organization of Petroleum Exporting Countries.

Operator — Person, whether proprietor or lessee, actually operating the well. Generally the oil company by whom the drilling contractor is engaged.

Perforate — Procedure for opening a zone to production by shooting holes through the casing and cement and into the formation, usually with a high pressure water jet.

Permeability — The capacity of the pores in a formation to transmit fluid. A measure of the degree of interconnection of the pore spaces.

Pool — Accumulation of oil or gas in the subsurface; takes the form of a network of interconnected pores in sedimentary formation or rock, as opposed to a surface-type "pool".

Porosity — The ratio of the volume of pores, or interstices in a rock, to the total volume of the rock. A measure of the ability of the rock to store oil, gas or water.

Primary Recovery — Production of oil through natural depletion of a reservoir, i.e. no water injection.

Probable Reserves — A realistic assessment of the reserves that will be recovered from known oil or gas fields based on the estimated ultimate size and reservoir characteristics of such fields.

Proven Reserves — This term defines the estimated quantity of crude oil or natural gas which analysis of geological and engineering data demonstrates with reasonable certainty to be recoverable from known oil or gas fields under existing economic and operating conditions.

Recovery Factor — The expected fraction or percentage of original oil-in-place that will be recovered under certain conditions (commonly 10-20% for primary recovery, 15-40% for secondary recovery).

Reservoir — An underground formation where oil or gas has accumulated. The formation consists of porous rock that holds droplets of oil and gas. If the rock pores are interconnected to allow oil or gas to move through it, it is called permeable rock. A reservoir can contain more than one pool.

Royalty — The landowner's share of production, usually free of expenses of production.

Seismic — A geophysical exploration method based on the measurement of wave front propagated by dynamite explosions or other sound generations.

Structure — The shape which layers of sedimentary rocks take on as a result of folding, faulting and tilting. These structures can aid in forming traps for hydrocarbon accumulation.

Trap — An enclosure of the sedimentary layers which permits containment of oil or gas over geologic time. The form of trapping can be structural or stratigraphic, where the porous zone thins out, or a combination of both.

Viscosity — A measure of the quality of an oil — its ability to flow. Low viscosity oils have naturally higher recovery factors than high viscosity (i.e. heavy) oils.

Waterflood — The increase in recovery from a pool through replacement of produced fluid with water. A pattern is usually formed with injection wells surrounded by producing wells. This process repressures the reservoir and displaces otherwise unrecoverable oil to producers.

Well — An encased hole in the ground from which petroleum or natural gas can be produced.

Working Interest — The interest in a lease which carries with it the rights and obligations to develop and operate an oil or gas property.

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